



IN-LINE CHROMATIC HARP WITH ADJUSTABLE STRING GUIDE

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to an in-line chromatic harp, and more particularly to an in-line chromatic harp with an adjustable string position guide which allows a harp player to quickly identify the proper string for each note and to play any chromatic scale as if playing the C major scale.

Description of the Related Art

An in-line chromatic harp is a string instrument which has the entire twelve semitones in an octave, like the piano, and therefore versatile in music performance. Its strings, like most harps, are arranged in one line. Since in each octave of the in-line chromatic harp has twelve strings instead of seven in a conventional harp, the string spacing is narrower so that each octave will not become too wide for the hands of the harp player. There are chromatic harps designed with two rows of strings, either parallel or cross each other to preserve the string spacing of

1 conventional harp. These harps had their position in
2 the history and have been around for centuries.

3
4 The advantage of an in-line chromatic harp is that
5 every one of the twelve semitones in each octave are
6 accessible from the finger tips without any additional
7 mechanical movement such as pushing a foot pedal or
8 moving a lever, which is the standard practice for harp
9 playing. For example, the concert harp requires the
10 player to push one of several pedals in order to play a
11 # or b (sharp or flat) note. For lever harp, the player
12 has to flip a lever to achieve the same result. These
13 require skills and training. It also limits the music
14 one can play and often the music may need to be re-
15 composed to suit the instrument.

16 The in-line chromatic harp is, however, not
17 without problems or difficulties, either. The most
18 serious problem is that for the in-line chromatic harp
19 the spacing between any two strings is generally
20 narrower than the conventional harp. The standard
21 color codes, red for "C" string and blue for "F" string,
22 are no longer adequate for the purpose of indicating
23 the string position because there are too many strings
24 in between. The regular harp has only two white
25 strings between the red string and blue string, and
26 three white strings between blue string and red string;

1 therefore, there is no difficulty in identifying the
2 location of any note or string. On the other hand, the
3 in-line chromatic harp, if using the same color code to
4 identify the "C" and the "F" strings, there will be
5 four narrowly spaced white strings between the "C" and
6 the "F" strings, and six narrowly spaced white strings
7 between the "F" and the "C" strings. This arrangement
8 becomes rather difficult to play because of the
9 excessive number of the closely spaced strings.

10
11 US Patent No. 2,137,160 discloses a guide to be
12 disposed just behind the string with the same white and
13 black key arrangement like the piano key so that anyone
14 skilled in playing piano or organ can readily acquire
15 proficiency in playing a harp with the guide.

16 17 18 BRIEF SUMMARY OF THE INVENTION 19

20 It is therefore an object of the invention to
21 provide an in-line chromatic harp with an adjustable
22 string position guide, wherein the adjustable string
23 position guide is rotatable.

24
25 To achieve the above-mentioned object, the
26 invention provides an in-line chromatic harp including
27 a body, a plurality of strings and an adjustable string

1 position guide. The body is formed of a pillar, a neck
2 and a sound box. The strings run from the neck to the
3 sound box. The adjustable string position guide is
4 movably installed behind the strings, with one end
5 fixed to the pillar and the other end to the neck. A
6 plurality of color dots is disposed on the surface of
7 the string position guide and arranged in a specific
8 pattern.

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10 The advantages of this invention will hereinafter
11 become more readily apparent from the following
12 specification and the enclosed drawings.

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15 BRIEF DESCRIPTION OF THE DRAWINGS

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17 FIG. 1 is a full side view of the invention.
18 FIG. 2 is a cross-sectional view of the section 2-2.
19 FIG. 3 is a perspective view of the structure of the
20 string position guide of the invention.
21 FIG. 4 is a drawing of the color dot patterns on the
22 string position guide of the invention.

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25 DETAILED DESCRIPTION OF THE INVENTION

1 Figure **1** is a full side view of the invention,
2 where the pillar **11**, neck **12**, sound box **13**, and the
3 strings **9** and bridge pin **18** are typical of a Celtic
4 folk harp. The adjustable string position guide **14** is
5 shown installed a small distance **C** behind the strings
6 as shown on figure **2**, so the string position guide **14**
7 will not interfere with the vibration of the strings **9**.
8 The string position guide **14** is mounted on the harp at
9 an angle **A** to the strings **9** as shown in figure **1**. The
10 string position guide **14** is positioned right above the
11 proper finger position for playing the harp so the
12 string position is easily identified with this
13 arrangement.

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15 Figure **2** is a cross-sectional view of section **2-2**.
16 Only the cross section of the adjustable string
17 position guide **14** is shown here at a small distance **C**
18 behind the strings **9**. The string position guide **14**
19 depicted here is a square bar or a four sided bar. The
20 bar can also be a triangular or hexagonal prism, and
21 the same principle applies. For the sake of
22 simplicity, from now on a square bar will be used in
23 this specification except where further clarification
24 is necessary.

25

26 Figure **3** shows a perspective view of the string
27 position guide **14** with the pivot/slide pins **15a** and **15b**

1 which are fastened on the pillar 11 and the neck 12 as
2 shown on figure 1, and with corresponding pivot/sliding
3 holes 16a and 16b which are drilled into each end of
4 the string position guide 14. On each side of the
5 string position guide 14 there are multiple dots of
6 different colors forming a special pattern which will
7 be described later. Since the string position guide 14
8 is not perpendicular to the strings 9, a string spacing
9. L on the string position guide 14 is equal to a true
10 string spacing S , as shown on figure 1, divided by sine
11 of the angle A , defined by the strings 9 and the string
12 position guide 14 as shown on figure 1. Since the
13 string spacing L on this harp is constant throughout
14 the whole range, which is different from most harps,
15 and therefore the string position guide 14 can slide in
16 a axial direction, as shown by an arrow 17, without
17 mismatching the color dot position to the strings 9 as
18 we will see later the significance of this feature.

19

20 The detailed layout of the color dot patterns on
21 the square bar is shown on figure 4. The color dot
22 patterns for the four sides 14a, 14b, 14c and 14d of
23 the square bar are being put side by side to show the
24 inter relationship of the dot patterns.

25

26 On the first side 14a of the square bar, the color
27 dots are arranged in the following way:

1 First dot is red and is located at distance **L** from
2 the left end. The second dot is white and is located
3 at distance **2L** from the first dot. The third dot is
4 also white and located at distance **2L** from the second
5 dot. The fourth dot is blue and located at distance **L**
6 from the third dot. The distance between fourth and
7 fifth is **2L**, fifth and sixth is **2L**, and sixth and
8 seventh is **2L**. The distance between seventh and eighth
9 is **L**. The spacing repeats itself for the rest of the
10 surface, in this case, for three times. However, this
11 should not be the limit and it depends on how many
12 octaves the harp has. As it is shown on figure **4**, the
13 first red dot represents the position for Do, the
14 second dot for Re, the third dot for Mi, the fourth
15 dot, a blue dot for Fa, the fifth dot for Sol, the
16 sixth dot for La, and the seventh dot for Ti, and the
17 eighth dot, a red dot again, back to Do of one octave
18 higher. This color code arrangement is the same as a
19 standard harp string color code, that is two white
20 strings between red and blue string and three white
21 strings between blue and red string and this makes the
22 learning transition from a standard harp to this new
23 in-line chromatic harp fairly easy.

24

25 The side **14a** is the first side of four sides which
26 can be used for string position guide. The second side
27 **14b**, the third side **14c**, and the fourth side **14d** can be

1 switched into position by turning the square bar on its
2 pivots **15a** and **15b** within the holes **16a** and **16b** as the
3 arrows indicated in figure 2.

4
5 On the second side **14b**, the dot spacing pattern is
6 the same as **14a** except the first red dot is shifted a
7 distance of **3L** to the right as shown in figure 4. On
8 the third side **14c**, the first red dot is shifted a
9 distance of **6L** to the right as shown in figure 4. On
10 the fourth side **14d**, the first red dot is shifted a
11 distance of **9L** to the right as shown in figure 4. If
12 the string position guide 14 is a triangular bar the
13 red dot lateral shift will be **4L** from one side to the
14 next side. If the string position guide 14 is a
15 hexagonal bar the red dot lateral shift will be **2L** from
16 one side to the next side.

17
18 It becomes apparent that, by turning the string
19 position guide **14** 90 degrees from one side to the next
20 side, the position of "Do" is shifted up or down three
21 half-tones depends upon the direction of turning. If
22 the string position guide 14 is a triangular bar, the
23 turning will be 120 degree, and if the string position
24 guide 14 is a hexagonal bar, the turning will be 60
25 degrees.

1 The string position guide 14 is held by two pivot
2 pins **15a** and **15b** inside the holes **16a** and **16b**. The
3 holes are deep enough so that the string position guide
4 **14** can slide axially up and down by at least three **L** as
5 shown by the arrow **17** on figures **1** and **3**. This allows
6 the first red dot or "Do" to be set at any of the three
7 positions at each side of the string position guide 14.
8 If the guide 14 is a triangular bar, the axial movement
9 will need to be at least four **L**, if the guide 14 is a
10 hexagon bar, the movement will need to be at least **2L**.

11

12 The result of this arrangement will allow "Do" on
13 this string position guide to be placed at any one of
14 the twelve possible positions of the chromatic music
15 scale required by music.

16

17 Since the patterns of the dot arrangement on all
18 four sides are the same, except that the dots for each
19 pattern are being shifted right or left, the finger
20 position, once learned by the player, would be the same
21 no matter in what "key" the music is written. This is
22 a tremendous simplification in playing music. In fact,
23 this makes playing this in-line chromatic harp a lot
24 easier than learning how to play piano, especially for
25 music composed in a scale, other than "C Major", with
26 many sharps or flats. This is an instrument for an

1 amateur to play like a professional without a long and
2 tedious learning process.

3
4 The color dot patterns on the string position
5 guide 14 can be made in black and white, as described
6 in US Patent No. 2,137,160, and shifted three half-tone
7 from one side to the next side. Further, anyone can
8 play the harp of the present invention with music
9 playing simplified and without the complicated usage of
10 the black keys when the music is not written in "C
11 major".

12
13 A special color mark (red is preferred in this
14 case) is placed on the bridge pin **18**, as depicted on
15 figure **1**, of the middle C string to identify the
16 starting reference point of the string position guide
17 14. This position designates the location of the
18 central note for the "C Major" scale.

19
20 The beauty of this invention is that there is no
21 mechanical motion to change the string length to
22 achieve semi-tones like either the pedal harp or the
23 lever harp. To slide the guide up or down a fraction
24 of an inch, or to turn the guide around its pivot is
25 very simple without even touching the string and yet
26 the chromatic music scale is transposed up and down at
27 the player's wish with minimal effort.

1

2 While the invention has been described by way of
3 examples and in terms of preferred embodiments, it is
4 to be understood that the invention is not limited to
5 the disclosed embodiments. To the contrary, it is
6 intended to cover various modifications. Therefore,
7 the scope of the appended claims should be accorded the
8 broadest interpretation so as to encompass all such
9 modifications.